



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

17 SEP 2007

MEMORANDUM

SUBJECT: Response to Comments and Final Corrective Measures Decision
Operable Units No. 2 and 3 and Contingent Restricted Residential Requirements
Union Pacific Railroad, 9th and Webster St., Omaha, NE

FROM: Ken Herstowski *KH*
RCRA Corrective Action and Permits Branch
Air and Waste Management Division

THRU: Lynn Slugantz, Chief *Lynn Slugantz*
RCRA Corrective Action and Permits Branch
Air and Waste Management Division

TO: Becky Weber, Director
Air and Waste Management Division

Attached for your review and approval is a response to comments and final corrective measures decision developed for the Union Pacific Railroad facility located at 9th and Webster St., Omaha, Nebraska. The final corrective measures will be implemented pursuant to our February 29, 2000, RCRA 3008(h) administrative order on consent with Union Pacific Railroad.

A public comment period was held from May 21 – July 13, 2007. Only Union Pacific Railroad submitted comments. Based upon our review of the comments, the corrective measures are unchanged from those proposed. The final corrective measures and cleanup levels for soil and groundwater are protective of non-residential use, and consist of the following: 1) excavation and offsite disposal of contaminated soil; 2) monitored natural attenuation; and 3) institutional controls. Contingent corrective measures and cleanup levels which are protective of restricted residential use are also established if future developments will include residential occupancy.

Becky Weber

Approved

9/27/07

Date

Disapproved

Date

Attachment – Executive Summary



27 SEP 2007

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Approved

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AWMD/RCAP:cas:h:/KHERSTOWSKI/FINALCORRECTIVEMEASURESDECISION
OU2ANDOU3APPROVALMEMO.DOC/091807

RCAP
HERSTOWSKI

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FIELD

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CNSL
STOY

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SLUGANTZ

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EXECUTIVE SUMMARY

UNION PACIFIC RAILROAD 9TH AND WEBSTER STREETS OMAHA, NEBRASKA RCRA ID# NED000829754

The United States Environmental Protection Agency (hereafter referred to as "EPA") prepared a Statement of Basis dated May 18, 2007, to propose corrective measures and cleanup levels for non-residential use of Union Pacific Railroad Operable Units Number 2 (UPRR OU2) and Number 3 (UPRR OU3) and propose contingent corrective measures and cleanup levels for all of the UPRR Operable Units, Union Pacific Railroad Operable Unit No. 1 (UPRR OU1), UPRR OU2 and UPRR OU3, to allow for restricted residential development. These contingent corrective measures and cleanup levels would only be necessary if either the buyer or seller of a property parcel or parcels wishes to remove the restrictions on non-residential uses. Union Pacific Railroad's (UPRR) facility is located in Omaha, Nebraska at 9th and Webster Streets. The facility originally encompassed approximately 210 acres and is just west of the Missouri River. EPA divided UPRR into three areas for cleanup called operable units. (See attached figure showing operable units.)

Public Participation activities associated with the May 18, 2007, Statement of Basis included announcements of the availability of the Statement of Basis, Administrative Record and a public comment period from May 21 – July 13, 2007. Only Union Pacific Railroad (UPRR) submitted comments. None of the issues or objections raised by UPRR required EPA to develop or modify the corrective measures proposed in the statement of basis.

SUMMARY OF FINAL CORRECTIVE MEASURES DECISION

For UPRR OU2:

UPRR OU2 is the approximately 110 acres of the facility (figure attached) which was not transferred to the City of Omaha for redevelopment into the Qwest Center and consists of the soil above the normal high groundwater table. The corrective measures for non-residential uses of UPRR-OU2 shall consist of the following:

EXCAVATION AND OFFSITE DISPOSAL OF CONTAMINATED SOIL AT UPRR OU2

EPA is requiring UPRR to excavate and disposed offsite at a landfill location approved by EPA soil containing contaminants above the non-residential soil cleanup levels.

EPA is establishing soil cleanup levels that are protective of non-residential uses of UPRR OU2 including construction workers, on-site workers and recreational users. These soil cleanup levels

are concentrations of contaminants in soil that are protective of human health during construction and redevelopment of the facility and later occupancy by workers.

INSTITUTIONAL CONTROLS AT UPRR OU2

EPA is requiring institutional controls restrict to use of the site to non-residential uses pursuant to an administrative order on consent between UPRR and EPA.

LONG-TERM MONITORING AND MAINTENANCE AT UPRR OU2

EPA is requiring UPRR to conduct long-term monitoring that includes periodic inspections of the facility to determine if property owners and/or tenants have complied with the restrictions imposed by the institutional controls and that the corrective measures are still protective of human health or the environment in light of any changed condition of the facility.

For UPRR OU3:

UPRR OU3 consists of the ground water beneath both UPRR OU1 and UPRR OU2. The corrective measures for non-residential uses of UPRR-OU3 shall consist of the following:

MONITORED NATURAL ATTENUATION OF CONTAMINATED GROUNDWATER AT UPRR OU3

EPA is requiring UPRR to conduct monitored natural attenuation (MNA) for contaminated groundwater. MNA encompasses a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater.

EPA is establishing groundwater cleanup levels that are protective of non-residential uses of UPRR OU3 including construction workers, on-site workers and recreational users. Using the information from EPA's Johnson and Ettinger Model, the cleanup levels are established to trigger contingent vapor intrusion mitigation in new or existing buildings and structures which will have human occupancy. Because of the restrictions being placed upon construction and groundwater use, EPA is not requiring cleanup to drinking water standards such as EPA's Maximum Contaminant Levels.

Using the information in the human health risk assessment, groundwater cleanup levels are also established to protect workers where construction of buildings and structures will require subsurface excavation.

LONG-TERM GROUNDWATER MONITORING AT UPRR OU3

EPA is requiring UPRR to conduct long-term groundwater monitoring at UPRR OU3 to document the effectiveness of MNA.

VAPOR INTRUSION MITIGATION AT UPRR OU3

EPA is requiring UPRR to conduct contingent vapor intrusion mitigation at UPRR OU3. The vapor intrusion mitigation corrective measure provides a menu of actions that can be taken to minimize or eliminate exposure to chemical vapors from contaminated groundwater beneath UPRR OU3. These technologies may be used singly or in combination as the situation dictates for both new buildings and existing buildings constructed where groundwater or soil gas shows the potential for adverse health effects from vapor intrusion. All new buildings constructed where groundwater or soil gas shows the potential for adverse health effects from vapor intrusion will at a minimum include passive barriers, passive venting and sealing the building envelope.

LONG-TERM MONITORING OF VAPOR INTRUSION CONTAMINANTS AT UPRR OU3

EPA is requiring UPRR to conduct long-term monitoring of vapor intrusion contaminants at UPRR OU3. The Long-Term Monitoring of Vapor Intrusion Contaminants includes, as appropriate, groundwater monitoring, soil vapor monitoring and/or monitoring of vapors in building interiors on a periodic basis to determine if contaminant concentrations are present, increasing or decreasing and the threat they pose to human health.

INSTITUTIONAL CONTROLS AT UPRR OU3

EPA is requiring institutional controls to restrict use of the site to non-residential uses pursuant to an administrative order on consent between UPRR and EPA.

CONTINGENT CORRECTIVE MEASURES FOR RESTRICTED RESIDENTIAL USE

EPA is establishing contingent corrective measures should residential occupancy be part of future redevelopment projects. Discussions with the City of Omaha officials lead EPA to believe that residential developments could be proposed for portions of UPRR OU1/UPRR OU3 or UPRR OU2/UPRR OU3 (please recall also that the groundwater beneath UPRR OU1 and UPRR OU2 is known as UPRR OU3). Therefore, EPA believes that it is prudent to establish contingent corrective measures and cleanup levels that are protective of human health and the environment in the event that residential development will occur. Not only will this provide for the widest range of redevelopment of the facility by allowing the City of Omaha and developers to make informed redevelopment decisions; but it will eliminate possible delays due to EPA's processes for modifying approved corrective measures and cleanup levels.

The restricted residential use will not include the extraction or other use of groundwater from UPRR OU3. Development projects without residential occupancy are not required to implement the contingent corrective measures established for restricted residential development. EPA cautions that it is unlikely that conversion of a non-residential development into a residential development could be accomplished due to the difficulty in assessing contaminant concentrations once a development is completed. In any event, amendment of the environmental covenants established pursuant to EPA's corrective measures above, which prohibit residential development, is required and will require approval and signature by both EPA and UPRR.

Before restricted residential development can occur, both soil and groundwater beneath the parcel or parcels of the facility where residential occupancy is proposed must be remediated to meet the restricted residential cleanup levels.

EXCAVATION, DISPOSAL and PROTECTIVE COVER FOR RESTRICTED RESIDENTIAL USES

EPA is requiring UPRR to excavate and dispose offsite at a landfill location approved by EPA soil containing contaminants above the restricted residential soil cleanup levels if residential uses of UPRR OU1/UPRR OU3 or UPRR OU2/UPRR OU3 will occur. Since lead is a primary soil contaminant at UPRR and is the contaminant being remediated by Superfund at the Omaha Lead site, the contingent corrective measures are consistent with the Omaha Lead Site Interim Record of Decision.

EPA is establishing soil cleanup levels that are protective of restricted residential uses of UPRR OU1 and UPRR OU2 including construction workers, on-site workers, recreational users and residents. These soil cleanup levels are based upon EPA Region 6 Human Health Medium Specific Screening Levels (2007).

MONITORED NATURAL ATTENUATION FOR RESTRICTED RESIDENTIAL USES AT UPRR OU3

EPA is requiring UPRR to conduct monitored natural attenuation (MNA) for contaminated groundwater. MNA encompasses a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater.

EPA is establishing groundwater cleanup levels that are protective of restricted residential uses of UPRR OU3 including construction workers, on-site workers, recreational users and residents. Using the information from EPA's Johnson and Ettinger Model, the cleanup levels in Table 6 below are established to trigger contingent vapor intrusion mitigation in new or existing buildings and structures which will have human residency. Because of the restrictions being placed upon construction and groundwater use, EPA is not requiring cleanup to drinking water standards such as EPA's Maximum Contaminant Levels.

Using the information in the human health risk assessment, groundwater cleanup levels are also established to protect workers where construction of buildings and structures will require subsurface excavation.

VAPOR INTRUSION MITIGATION FOR RESTRICTED RESIDENTIAL USES AT UPRR OU3

EPA is requiring UPRR to conduct contingent vapor intrusion mitigation at UPRR OU3 that is protective of restricted residential use. The vapor intrusion mitigation corrective measure provides a menu of actions that can be taken to minimize or eliminate exposure to chemical vapors from contaminated groundwater beneath UPRR OU3. These technologies may be used

singly or in combination as the situation dictates for both new buildings and existing buildings constructed where groundwater or soil gas shows the potential for adverse health effects from vapor intrusion. All new buildings constructed where groundwater or soil gas shows the potential for adverse health effects from vapor intrusion will at a minimum include passive barriers, passive venting and sealing the building envelope.

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EPA is requiring UPRR to conduct long-term monitoring of vapor intrusion contaminants at UPRR OU3. The Long-Term Monitoring of Vapor Intrusion Contaminants includes, as appropriate, groundwater monitoring, soil vapor monitoring and/or monitoring of vapors in building interiors on a periodic basis to determine if contaminant concentrations are present, increasing or decreasing and the threat they pose to human health.

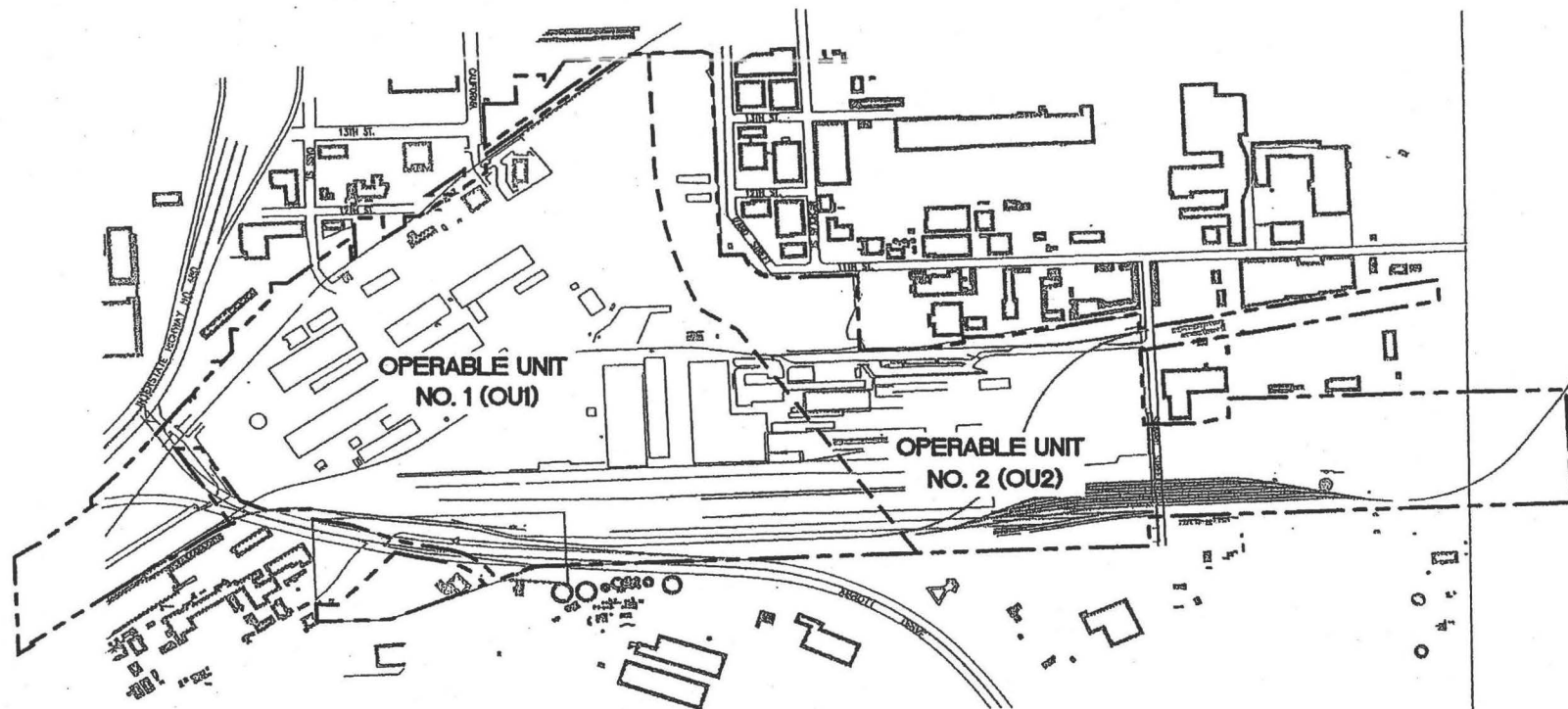
INSTITUTIONAL CONTROLS FOR RESTRICTED RESIDENTIAL USE AT UPRR OU1/UPRR OU3 AND/OR UPRR OU2/UPRR OU3

EPA is requiring institutional controls to restrict use of the site to restricted residential uses pursuant to an administrative order on consent between UPRR and EPA.

LONG-TERM MONITORING AND MAINTENANCE OF INSTITUTIONAL CONTROLS FOR RESTRICTED RESIDENTIAL USES AT UPRR OU1/UPRR OU3 AND/OR UPRR OU2/UPRR OU3

EPA is requiring UPRR to conduct long-term monitoring that includes periodic inspections of restricted residential uses of UPRR OU1/UPRR OU3 and UPRR OU2/UPRR OU3 to determine if property owners and/or tenants have complied with the restrictions imposed by the institutional controls and that the corrective measures are still protective human health or the environment in light of any changed condition of the facility.

Attachment



NOTE:
OPERABLE UNIT NO. 3 (OU3) INCLUDES
GROUNDWATER UNDERLYING THE
ENTIRE OMAHA SHOPS PROPERTY.

LEGEND

--- PROPERTY LINE
--- OPERABLE UNIT



OPERABLE UNITS



OMAHA SHOPS
UNION PACIFIC RAILROAD COMPANY



URS Greiner Woodward Clyde

DRN BY DAP	DATE 11/30/99	PROJECT NO.	FIG. NO.
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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7**

**RESPONSE TO COMMENTS
AND
FINAL CORRECTIVE MEASURES DECISION**

**CORRECTIVE MEASURES FOR OPERABLE UNITS NUMBER 2 AND 3
AND
CONTINGENT RESTRICTED RESIDENTIAL CORRECTIVE MEASURES
FOR OPERABLE UNITS NUMBER 1, 2 AND 3**

**UNION PACIFIC RAILROAD
9TH AND WEBSTER STREETS
OMAHA, NEBRASKA
RCRA ID# NED000829754**

The United States Environmental Protection Agency (hereafter referred to as "EPA") prepared a Statement of Basis dated May 18, 2007, to propose corrective measures and cleanup levels for non-residential use of Union Pacific Railroad Operable Units Number 2 (UPRR OU2) and Number 3 (UPRR OU3) and propose contingent corrective measures and cleanup levels for all of the UPRR Operable Units to allow for restricted residential development. These contingent corrective measures and cleanup levels would only be necessary if either the buyer or seller of a property parcel or parcels wishes to remove the restrictions on non-residential uses. Union Pacific Railroad's (UPRR) facility is located in Omaha, Nebraska at 9th and Webster Streets. The facility originally encompassed approximately 210 acres and is just west of the Missouri River. EPA divided UPRR into three areas for cleanup called operable units. (See attached figure showing operable units.)

Public Participation activities associated with the May 18, 2007, Statement of Basis included the following announcements of the availability of the Statement of Basis, Administrative Record and a public comment period.

- Fact Sheet faxed on Fri., May 11, 2007, to Sen. Ben Nelson - Omaha office, Sen. Chuck Hagel - Omaha office, Rep. Lee Terry - Omaha office
- Mailed to the mailing list, Thurs., May 17, 2007
- Placed on R7's web site, Thurs., May 17, 2007
- Public notice published May 21, 2007, as a display ad in the Omaha World Herald
- Public notice broadcast on KFAB-AM on May 21, 2007, and June 5, 2007
- Information shared with the Neighborhood Center for Greater Omaha and various media outlets

FINAL CORRECTIVE MEASURES DECISION
UNION PACIFIC RAILROAD OPERABLE UNITS NUMBER 2 AND 3 AND CONTINGENT RESTRICTED
RESIDENTIAL CORRECTIVE MEASURES FOR UPRR OU1, UPRR OU2 AND UPRR OU3

UNION PACIFIC RAILROAD, 9TH AND WEBSTER, OMAHA, NEBRASKA
RCRA ID# NED000829754

The Statement of Basis and administrative record were available throughout the comment period at the W. Dale Clarke Branch of the Omaha Public Library at 215 S. 15th St. and at the EPA Region 7 Information Resource Center, 901 N. 5th St., Kansas City, Kansas. The public comment period was from May 21, 2007 until July 13, 2007. A public availability session to ask questions about the proposed final cleanup plan was held on June 5, 2007, from 4:30 p.m. to 7:30 p.m. at the Omaha Public Schools Teacher Administrative Center Board Room, 3215 Cuming St., Omaha, Nebraska. EPA extended the public comment period from July 7 until July 13 by announcement at the public availability session.

RESPONSE TO PUBLIC COMMENTS

EPA received written comments within the public comment period from a single commenter. EPA thanks the commenter for their comments and taking time to participate in the corrective measure selection process. The following summarizes the comments received and provides EPA's response:

Comment: The commenter points out several typographical errors in the Statement of Basis.

Response: EPA agrees with the commenter and regrets the typographical errors.

Comment: The commenter points out that the text describes the non-residential cleanup levels for carcinogenic contaminants of concern as being developed based upon a target risk of 1×10^{-5} while several of the entries in the table "Proposed Soil Cleanup Levels" appear to be based upon a target risk level of 1×10^{-6} . The commenter requests EPA's final decision correct the cleanup levels for methylene chloride, trichloroethene, vinyl chloride, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, bis(2ethylhexyl)phthalate, chlordane, 4,4-DDE, 4,4-DDT, dieldrin and chromium to those representing a target risk of 1×10^{-5} .

Response: EPA agrees with the commenter and has included the correct non-residential soil cleanup levels representing a target risk of 1×10^{-5} for carcinogenic constituents in Table 1 below.

Comment: The commenter believes that the vapor intrusion mitigation discussion beginning on page 27 of the Statement of Basis is applicable only to new building construction and the proposed vapor mitigation technologies should not be required for any existing buildings at UPRR OU3.

Response: EPA intended the discussion in the Statement of Basis regarding vapor intrusion to apply to both existing buildings and those which may be constructed in the future and proposed presumptive vapor intrusion mitigation technologies appropriate for both new and existing structures. EPA has carefully considered the commenter's request that vapor intrusion

FINAL CORRECTIVE MEASURES DECISION FOR
UNION PACIFIC RAILROAD OPERABLE UNITS NUMBER 2 AND 3 AND CONTINGENT RESTRICTED
RESIDENTIAL CORRECTIVE MEASURES FOR UPRR OU1, UPRR OU2 AND UPRR OU3

UNION PACIFIC RAILROAD, 9TH AND WEBSTER, OMAHA, NEBRASKA
RCRA ID# NED000829754

mitigation only be applied to buildings which may be constructed following the final corrective measures decision and has reviewed the relevant information in the administrative record. ,

EPA believes that, based upon the information provided in the RCRA Facility Investigation (RFI), existing structures above UPRR OU3 currently do not require the installation of vapor intrusion mitigation technologies. The long term monitoring required below is intended, in pertinent part, to assess the concentration of volatile organic constituents in groundwater, soil gas and if necessary interior building spaces. EPA will evaluate the results of the long term monitoring and any other information received to determine when vapor intrusion mitigation is necessary for existing or proposed buildings and other occupied structures.

Therefore, EPA has provided in the final corrective measures decision a requirement to install vapor intrusion at both existing and future buildings and structures when necessary to protect human health.

Comment: The commenter notes that the RFI shows evidence of groundwater contamination upgradient to the facility. The commenter believes that UPRR should not be held accountable for implementing corrective measures at the facility for contaminated groundwater that migrates onto the facility from offsite or for groundwater that could become contaminated from exfiltration from city sewers beneath the site.

Response: EPA did not attempt to allocate responsibility for releases of hazardous waste or hazardous constituents in the Statement of Basis. Such an analysis is unnecessary for the purposes of proposing or selecting the corrective measures for the facility. EPA understands the commenter's concern that various industries have operated around the facility and that contamination from offsite could move onto the facility resulting in a condition that endangers human health or the environment.

Other changes included in the final corrective measures decision: EPA has determined that the contingent restricted residential remedy, specifically dealing with lead contaminated soil, should be modified from that proposed to more closely follow the "Omaha Lead Site, Operable Unit No. 1, Interim Record of Decision," (Omaha Lead Decision) dated December 15, 2004. The primary difference between the corrective measures proposed in the statement of basis and those being finalized here is the elimination of the use of soil or other cover to mitigate exposure to lead contaminated soil. Instead, excavation and offsite disposal of lead contaminated soil will be required and is consistent with EPA's Omaha Lead Decision. By doing this, the cleanup levels and required excavation of lead contaminated soil will neither be more or less stringent for residential properties whether they are being addressed by Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) pursuant to the Omaha Lead Decision or by the contingent corrective measures set forth in this corrective measures decision.

EPA does not believe that additional public notice is necessary as the interim record of decision was issued in accordance with the public participation requirements established pursuant to the

FINAL CORRECTIVE MEASURES DECISION
UNION PACIFIC RAILROAD OPERABLE UNITS NUMBER 2 AND 3 AND CONTINGENT RESTRICTED
RESIDENTIAL CORRECTIVE MEASURES FOR UPRR OU1, UPRR OU2 AND UPRR OU3

UNION PACIFIC RAILROAD, 9TH AND WEBSTER, OMAHA, NEBRASKA
RCRA ID# NED000829754

CERCLA. If portions of UPRR will have residential use those portions would be within the scope of the Omaha Lead Decision and therefore application of the Omaha Lead Decision is appropriate for lead contaminated soil for those portions of UPRR. EPA has made this change from the corrective measures proposed in the Statement of Basis to those set forth in this final corrective measures decision to harmonize the approach for cleaning up lead contaminated soil in Omaha. EPA intends the contingent corrective measures for restricted residential use set forth in this corrective measures decision to be utilized for both lead contaminated soil, soil contaminated with other hazardous wastes and hazardous constituents and contaminated groundwater.

DECLARATION OF FINAL CORRECTIVE MEASURES DECISION

For UPRR OU2:

UPRR OU2 is the approximately 110 acres of the facility (figure attached) which was not transferred to the City of Omaha for redevelopment into the Qwest Center and consists of the soil above the normal high groundwater table. The corrective measures for non-residential uses of UPRR-OU2 shall consist of the following:

EXCAVATION AND OFFSITE DISPOSAL OF CONTAMINATED SOIL AT UPRR OU2

The EPA is selecting excavation and offsite disposal of contaminated soil at UPRR OU2 as a corrective measure. Soil containing contaminants above the non-residential soil cleanup levels listed in Table 1 below shall be excavated and disposed offsite at a landfill location approved by EPA. If the final development elevation will be below the original elevation at the time of the UPRR OU2 RFI, soil will be excavated to a minimum of one foot below the final development elevation and backfilled with clean soil. Subsurface soil exceeding the corrective action objectives will be excavated of subsurface soil to a depth of one foot below the depth of required construction wherever development requires subsurface construction. The resulting excavations will be backfilled with clean soil.

UPRR excavated lead contaminated soil from UPRR OU2 and disposed of the excavated soil in an onsite soil repository in conjunction with the UPRR OU1 corrective measures¹ as an interim measure. UPRR also excavated contaminated soil from the Paint Barrel Pits (solid waste management unit (SWMU) 14), the North and South Acetylene Sludge Pits (SWMU 20), asbestos contaminated soil and diesel fuel contaminated soil as interim measures. EPA has determined that the interim measures conducted to date are consistent with, and contribute to, the performance of the UPRR OU2 corrective measures herein.

¹ UPRR's implementation of corrective measures at OU1 included placement of contaminated soil into an onsite embankment used to construct Abbott Drive. In addition, UPRR excavated lead contaminated soil in OU2 as an interim measure and placed that soil with the soil excavated from OU1 in the same embankment. The contaminated soil from OU2 which was excavated and disposed with the soil from OU1 in the onsite embankment is proposed to remain in the embankment. See discussion later regarding this interim measure implemented by UPRR.

FINAL CORRECTIVE MEASURES DECISION FOR
UNION PACIFIC RAILROAD OPERABLE UNITS NUMBER 2 AND 3 AND CONTINGENT RESTRICTED
RESIDENTIAL CORRECTIVE MEASURES FOR UPRR OU1, UPRR OU2 AND UPRR OU3

UNION PACIFIC RAILROAD, 9TH AND WEBSTER, OMAHA, NEBRASKA
RCRA ID# NED000829754

As described above, interim measures have removed contaminated soil to stabilize the facility so that, in its current state and use by UPRR as a railroad yard, no immediate action is needed to remove additional volumes of contaminated soil. However, details of construction related to redevelopment are yet to be defined. Therefore, UPRR shall determine if all areas of each proposed redevelopment meet the soil cleanup levels appropriate for proposed use, i.e., non-residential or in certain cases residential. UPRR shall then excavate and dispose of offsite such contaminated soil as is necessary in order to meet the requirements of the UPRR OU2 corrective measures.

INSTITUTIONAL CONTROLS AT UPRR OU2

The EPA is selecting institutional controls to prohibit non-residential use and preserve the implemented corrective measures at UPRR OU2 as a corrective measure. Institutional controls are non-engineering measures intended to affect human activities in such a way as to prevent or reduce exposure to hazardous substances. There are four categories of institutional controls: government controls; proprietary controls (controls based on private property law); enforcement agreements with governmental agencies; and informational devices (informational tools that provide information or notification that residual or capped contamination may remain on site). Institutional controls implemented by UPRR shall provide for, but not be limited to, the following restrictions at UPRR OU2:

- UPRR OU2 shall not be used, developed or operated in any manner that will impair, degrade or compromise the corrective measures set forth in this corrective measures decision.
- UPRR OU2 shall not be used or developed for any residential purpose.

LONG-TERM MONITORING AND MAINTENANCE AT UPRR OU2

The EPA is selecting long-term monitoring and maintenance of institutional controls at UPRR OU2 as a corrective measure. Long-term monitoring and maintenance is necessary for the continued effectiveness of the institutional controls. Long-term monitoring shall include periodic inspections of the facility to determine if property owners and/or tenants have complied with the restrictions imposed by the institutional controls and that the corrective measures are still protective of human health or the environment in light of any changed condition of the facility.

Note that any condition that may pose an immediate or potential threat to human health or the environment identified during monitoring or other activity shall be reported to EPA in accordance with paragraph 36 of the Administrative Order on Consent.

FINAL CORRECTIVE MEASURES DECISION
UNION PACIFIC RAILROAD OPERABLE UNITS NUMBER 2 AND 3 AND CONTINGENT RESTRICTED
RESIDENTIAL CORRECTIVE MEASURES FOR UPRR OU1, UPRR OU2 AND UPRR OU3

UNION PACIFIC RAILROAD, 9TH AND WEBSTER, OMAHA, NEBRASKA
RCRA ID# NED000829754

UPRR OU2 NON-RESIDENTIAL SOIL CLEANUP LEVELS

EPA is establishing soil cleanup levels that are protective of non-residential uses of UPRR OU2 including construction workers, on-site workers and recreational users. Using the information in the human health risk assessment, soil cleanup levels, also called corrective action objectives, are established for the constituents of potential concern (COPCs) in soil. These soil cleanup levels are concentrations of contaminants in soil that are protective of human health during construction and redevelopment of the facility and later occupancy by workers.

In accordance with EPA's National Contingency Plan, for known or suspected carcinogens, acceptable cleanup levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 1 in 10,000 (referred to as 1×10^{-4} risk) and 1 in 1,000,000 (referred to as 1×10^{-6} risk) using information on the relationship between dose and response. The 1×10^{-6} risk level shall be used as the point of departure for determining remediation goals for alternatives when applicable or relevant and appropriate requirements are not available or are not sufficiently protective because of the presence of multiple contaminants at a site or multiple pathways of exposure. (40 CFR 300.430(e)(2)(i)(A)(2)) EPA is proposing soil cleanup levels based upon 1×10^{-5} target risk. A target risk of 1×10^{-5} is the mid-point of EPA's range of 1×10^{-4} to 1×10^{-6} for cancer risks. EPA believes that this provides an adequate level of protection for occupational workers since the risk assessment was based upon exposure factors for outdoor workers and not indoor workers. The risk to indoor workers would be significantly below EPA's lowest target cancer risk of 1×10^{-6} .

In accordance with EPA's National Contingency Plan for chemicals which are not known or suspected carcinogens (non- carcinogenic contaminants), a HQ of 1 (or less) is considered to be safe for human health. EPA is proposing soil cleanup levels where the total HQ is 1 or above. The cleanup levels calculated will also meet the requirements of EPA's National Contingency Plan. (40 CFR 300.430(e)(2)(i)(A)(1))

EPA's "Technical Review Workgroup for Lead" has developed interim guidance for assessing lead risks and establishing corrective action objectives so that blood lead levels in at risk (pregnant) workers will not exceed 10 micrograms per deciliter. For lead, the non-residential cleanup level was developed using EPA's Adult Lead Model.

TABLE 1
NON-RESIDENTIAL SOIL CLEANUP LEVELS

Contaminant	Health Effect	Non-Residential Cleanup Level (mg/kg)
Acetone	Toxicity	54000
Benzene	Cancer	24

ANNUAL CORRECTIVE MEASURES DECISION FOR
UNION PACIFIC RAILROAD OPERABLE UNITS NUMBER 2 AND 3 AND CONTINGENT RESTRICTED
RESIDENTIAL CORRECTIVE MEASURES FOR UPRR OU1, UPRR OU2 AND UPRR OU3

UNION PACIFIC RAILROAD, 9TH AND WEBSTER, OMAHA, NEBRASKA
RCRA ID# NED000829754

Contaminant	Health Effect	Non-Residential Cleanup Level (mg/kg)
cis-1,2-Dichloroethene	Toxicity	150
Trans-1,2-Dichloroethene	Toxicity	230
Ethyl Benzene	Toxicity	6000
Methylene Chloride	Cancer	210
Toluene	Toxicity	2000
Tetrachloroethene	Cancer	13
1,1,1-Trichloroethane	Toxicity	1200
Trichloroethene	Cancer	1.1
1,2,4-Trimethylbenzene	Toxicity	170
Vinyl Chloride	Cancer	7.5
Xylenes	Toxicity	4500
Anthracene	Toxicity	100000
Benzo(a)anthracene	Cancer	21
Benzo(a)pyrene	Cancer	2.1
Benzo(b)fluoranthene	Cancer	2
Chrysene	Cancer	2100
Dibenzo(a,h)anthracene	Cancer	2.1
Fluoranthene	Toxicity	22000
Indeno(1,2,3-cd)pyrene	Cancer	21
Pyrene	Toxicity	29000
Naphthalene	Toxicity	190
Bis(2-ethylhexyl)phthalate	Cancer	1200
Chlordane	Cancer	65
4,4-DDE	Cancer	70
4,4-DDT	Cancer	70
Dieldrin	Cancer	1.1
Endosulfan II	Toxicity	3700
Endrin aldehyde	Toxicity	180
PCBs (total all PCBs)	Toxicity	14
Antimony	Toxicity	4100
Arsenic	Toxicity	440
Cadmium	Toxicity	450
Chromium	Cancer	4500
Copper	Toxicity	41000
Lead	Toxicity	1218
Mercury	Toxicity	310
Selenium	Toxicity	5100

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Contaminant	Health Effect	Non-Residential Cleanup Level (mg/kg)
Silver	Toxicity	5100
Zinc	Toxicity	100000

For UPRR OU3:

UPRR OU3 consists of the ground water beneath both UPRR OU1 and UPRR OU2. The corrective measures for non-residential uses of UPRR-OU3 shall consist of the following:

MONITORED NATURAL ATTENUATION OF CONTAMINATED GROUNDWATER AT UPRR OU3

The EPA is selecting monitored natural attenuation (MNA) of contaminated groundwater at UPRR OU3 as a corrective measure. The MNA corrective measure encompasses a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. These in-situ processes include biodegradation; dispersion; dilution; sorption; volatilization; radioactive decay; and chemical or biological stabilization, transformation, or destruction of contaminants. The implementation of MNA shall be consistent with established guidance and/or protocols and shall scientifically determine whether MNA is occurring at rates sufficient to be protective of human health and the environment and provide a scientifically defensible estimate of the timeframe that will be required for MNA to attain the cleanup levels in Tables 3 and 4 below.

Note that any condition that may pose an immediate or potential threat to human health or the environment identified during monitoring or other activity shall be reported to EPA in accordance with paragraph 36 of the Administrative Order on Consent.

LONG-TERM GROUNDWATER MONITORING AT UPRR OU3

The EPA is selecting long-term monitoring of groundwater at UPRR OU3 as a corrective measure. Long-term monitoring shall consist of a network of permanent, i.e., groundwater monitoring wells, and non-permanent, i.e., direct push, groundwater monitoring locations to monitor the progress and effectiveness of MNA and to determine if hazardous waste or hazardous constituents are migrating on to or off of the facility and at what concentration.

VAPOR INTRUSION MITIGATION AT UPRR OU3

The EPA is selecting vapor intrusion mitigation at UPRR OU3 as a corrective measure. The vapor intrusion mitigation corrective measure provides a menu of pre-approved actions that can

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be taken to minimize or eliminate exposure to chemical vapors from contaminated groundwater beneath UPRR OU3. These technologies may be used singly or in combination as the situation dictates for both new buildings and existing buildings where information shows the potential for adverse health effects from vapor intrusion. Where installed, vapor mitigation technologies must be monitored, operated and maintained to be effective.

Table 2 below includes those vapor mitigation technologies which are approved by EPA. UPRR may also propose in the CMI workplan other technologies or methods to protect human health from vapor intrusion.

TABLE 2
APPROVED VAPOR MITIGATION TECHNOLOGIES

Technology	Typical applications	Challenges
Passive Barrier	<ul style="list-style-type: none"> • New construction • Crawl spaces • Often combined with passive or active venting, sealing openings in the slab, drains, etc. 	<ul style="list-style-type: none"> • Preventing tears, holes • May not suffice as a stand-alone technology • Ensuring caulking seals cracks in floors, etc. • Thinner, less-expensive barriers likely to be inadequate
Passive Venting	<ul style="list-style-type: none"> • New construction • Low soil gas flux sites • Should be convertible to active system if necessary 	<ul style="list-style-type: none"> • Relies on advective flow of air due to wind and heat stack effects • Air flows and suction typically far less than achieved by fans
Subslab Depressurization (SSD)	<ul style="list-style-type: none"> • New and existing structures • Sumps, drain tiles, and block wall foundations may also be depressurized if present 	<ul style="list-style-type: none"> • Low permeability and wet soils may limit performance
Submembrane Depressurization	<ul style="list-style-type: none"> • Existing structures • Crawl spaces 	<ul style="list-style-type: none"> • Sealing to foundation wall, pipe penetrations • Membranes may be damaged by occupants or trades people accessing crawl space
Subslab Pressurization	<ul style="list-style-type: none"> • Same as SSD • Most applicable to highly permeable soils 	<ul style="list-style-type: none"> • Higher energy costs and less effective than SSD • Potential for short-circuiting through cracks
Building Pressurization	<ul style="list-style-type: none"> • Large non-residential structures, new or existing • Sensitive receptors 	<ul style="list-style-type: none"> • Requires regular air balancing and maintenance • May not maintain positive pressure when building is unoccupied
Indoor Air Treatment	<ul style="list-style-type: none"> • Specialized cases only 	<ul style="list-style-type: none"> • Typically generates a waste disposal stream • Effective capture of air contaminants may be difficult • Energy-intensive, with significant operation, maintenance, and monitoring burden
Sealing the Building Envelope	<ul style="list-style-type: none"> • Cracks and holes in existing buildings 	<ul style="list-style-type: none"> • Access to perforations • Permanence

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LONG-TERM MONITORING OF VAPOR INTRUSION CONTAMINANTS AT UPRR OU3

The EPA is selecting long-term monitoring of vapor intrusion contaminants at UPRR OU3 as a corrective measure. The Long-Term Monitoring of Vapor Intrusion Contaminants includes, as appropriate, groundwater monitoring, soil vapor monitoring and/or monitoring of vapors in building interiors on a periodic basis to determine if contaminant concentrations are present, increasing or decreasing and the threat they pose to human health.

INSTITUTIONAL CONTROLS AT UPRR OU3

The EPA is selecting institutional controls to prohibit groundwater use and preserve the implemented corrective measures at UPRR OU3 as a corrective measure. Institutional controls are non-engineering measures intended to affect human activities in such a way as to prevent or reduce exposure to hazardous substances. There are four categories of institutional controls: government controls; proprietary controls (controls based on private property law); enforcement agreements with governmental agencies; and informational devices (informational tools that provide information or notification that residual or capped contamination may remain on site). Institutional controls implemented by UPRR shall provide for, but not be limited to, the following restrictions:

- UPRR OU2 shall not be used, developed or operated in any manner that will impair, degrade or compromise the corrective measures set forth in this corrective measures decision.
- UPRR OU3 shall not be used for the installation and/or use of domestic, irrigation and other water wells of any type except for groundwater monitoring wells and temporary dewatering wells for construction purposes.

LONG-TERM MONITORING OF INSTITUTIONAL CONTROLS

The EPA is selecting long-term monitoring and maintenance of institutional controls at UPRR OU3 as a corrective measure. Long-term monitoring and maintenance is necessary for the continued effectiveness of the institutional controls. Long-term monitoring shall include periodic inspections of the facility to determine if property owners and/or tenants have complied with the restrictions imposed by the institutional controls and that the corrective measures are still protective of human health or the environment in light of any changed condition of the facility.

Note that any condition that may pose an immediate or potential threat to human health or the environment identified during monitoring or other activity shall be reported to EPA in accordance with paragraph 36 of the Administrative Order on Consent.

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UPRR OU3 NON-RESIDENTIAL GROUNDWATER CLEANUP LEVELS

EPA selects corrective measures for contaminated groundwater that will return usable groundwater to its maximum beneficial use, wherever practicable, within a timeframe that is reasonable given the particular circumstances of the facility. (see Advance Notice of Proposed Rulemaking, 61 FR 19432, May 1, 1996, pages: 19448-52) Within the range of reasonably expected uses and exposures, the maximum beneficial groundwater use is the one which that warrants the most stringent groundwater cleanup levels and approaches. EPA recognizes that "usable" groundwater may serve a variety of purposes. Common purposes of groundwater include, for example, drinking water, agricultural irrigation, car washes, and manufacturing. Groundwater also has less formally acknowledged purposes such as replenishing adjacent aquifers or surface water bodies.

The groundwater at UPRR OU3 would be of sufficient quantity and quality, if contaminants were removed to appropriate standards, to be used as drinking water. EPA examined the likelihood that groundwater at UPRR OU3 would be used for drinking water to determine appropriate groundwater cleanup levels. EPA found that the City of Omaha prohibits the installation of drinking water wells by city ordinance. EPA also reviewed the City of Omaha's redevelopment plans for north downtown Omaha. Based upon this information, EPA determined that cleanup to drinking water standards such as EPA's Maximum Contaminant Levels (MCL) would not be required. EPA will review the groundwater cleanup levels required for UPRR OU3 on a periodic basis to determine if more stringent cleanup levels are necessary.

The groundwater cleanup levels are calculated to meet the requirements of EPA's National Contingency Plan and to protect human health. For carcinogenic contaminants, the non-residential use cleanup levels are proposed at a target excess cancer risk of 1×10^{-5} . A target risk of 1×10^{-5} is the mid-point of EPA's range of 1×10^{-4} to 1×10^{-6} for cancer risks. EPA believes that this provides an adequate level of protection for occupational workers in UPRR OU3 because of site specific factors. For non-carcinogenic contaminants, the non-residential use cleanup levels are based upon a HQ of 1.

EPA is establishing groundwater cleanup levels that are protective of non-residential uses of UPRR OU3 including construction workers, on-site workers and recreational users (see Tables 3 and 4 below). Using the information from EPA's Johnson and Ettinger Model, the cleanup levels in Table 3 are established to trigger contingent vapor intrusion mitigation in new or existing buildings and structures which will have human occupancy. Note that while the cleanup levels in Table 3 are believed to be protective of human health and environment; if monitoring shows that the risk to human health from volatile organic chemicals from vapor intrusion exceeds a cancer risk of 1×10^{-5} or a hazard quotient of 1 then interim measures or additional corrective measure will be necessary.

It should be noted that non-residential development which may occur in areas that exceed the Johnson and Ettinger calculated groundwater target levels in Table 3 is prohibited unless those

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development projects include vapor mitigation measures to prevent potential human exposure to harmful levels of chemical vapors. The exact methods of construction and vapor mitigation will require EPA approval before the development can begin.

Using the information in the human health risk assessment, groundwater cleanup levels are also established to protect workers where construction of buildings and structures will require subsurface excavation. Table 4 below establishes the groundwater cleanup levels for subsurface construction.

TABLE 3
NON-RESIDENTIAL GROUNDWATER CLEANUP LEVELS FOR VAPOR INTRUSION

Contaminant	Vapor Intrusion Non-Residential GW Cleanup Level (µg/L)
Benzene	408
n-Butylbenzene	14,000
Tert-Butylbenzene	13,707
Chlorobenzene	12,852
Chloroethane	823
Chloroform	170
1,2-Dichlorobenzene	82,380
1,1-Dichloroethene	4,689
cis-1,2-Dichloroethene	5,694
trans-1,2-Dichloroethene	5,568
Ethylbenzene	261
Isopropylbenzene	518
Methylene Chloride	11,662
Methyl tertbutyl ether	15,500,600
Naphthalene	2,679
n-Propylbenzene	16,674
Tetrachloroethene	488
Trichloroethylene	19
1,2,4-Trimethylbenzene	1,368
1,3,5-Trimethylbenzene	1,173
Vinyl Chloride	54
Xylenes	178,000

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TABLE 4
GROUNDWATER CLEANUP LEVELS FOR SUBSURFACE CONSTRUCTION

Contaminant	Subsurface Construction GW Cleanup Level (µg/L)
Benzene	70
Chlorobenzene	285
cis-1,2-Dichloroethene	19,548
1,4-Dioxane	30
Tetrachloroethene	1,719
Trichloroethylene	62
Vinyl Chloride	230
<i>Metals</i>	
Barium	14,234
Chromium	598

CONTINGENT CORRECTIVE MEASURES FOR RESTRICTED RESIDENTIAL USE

Discussions with the City of Omaha officials lead EPA to believe that residential developments could be proposed for portions of UPRR OU1/UPRR OU3 or UPRR OU2/UPRR OU3 (please recall also that the groundwater beneath UPRR OU1 and UPRR OU2 is known as UPRR OU3).

The corrective measures above are for non-residential uses of the facility and are not protective of residential developments. Therefore, EPA believes that it is prudent to establish contingent corrective measures and cleanup levels that are protective of human health and the environment in the event that residential development will occur. Not only will this provide for the widest range of redevelopment of the facility by allowing the City of Omaha and developers to make informed redevelopment decisions; but it will eliminate possible delays due to EPA's processes for modifying approved corrective measures and cleanup levels.

The restricted residential use will not include the extraction or other use of groundwater from UPRR OU3. Development projects without residential occupancy are not required to implement the contingent corrective measures established for restricted residential development. EPA cautions that it is unlikely that conversion of a non-residential development into a residential development could be accomplished due to the difficulty in assessing contaminant concentrations once a development is completed. In any event, amendment of the environmental covenants established pursuant to EPA's corrective measures above, which prohibit residential development, is required and will require approval and signature by both EPA and UPRR.

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Before restricted residential development can occur, both soil and groundwater beneath the parcel or parcels of the facility where residential occupancy is proposed must be remediated to meet the restricted residential cleanup levels.

EPA establishes the following contingent restricted residential corrective measures:

EXCAVATION AND OFF-SITE DISPOSAL FOR RESTRICTED RESIDENTIAL USES

The EPA is selecting excavation and off-site disposal of contaminated soil as a contingent corrective measure for restricted residential use. If residential uses of UPRR OU1/UPRR OU3 or UPRR OU2/UPRR OU3 shall occur, soil containing contaminants above the restricted residential soil cleanup levels listed in Table 5 below shall be excavated and disposed offsite at a landfill location approved by EPA. If the final development elevation will be below the original elevation at the time of the UPRR OU1 RFI and/or the UPRR OU2 RFI, soil will be excavated to a minimum of one foot below the final development elevation and backfilled with clean soil. Subsurface soil exceeding the corrective action objectives will be excavated of subsurface soil to a depth of one foot below the depth of required construction wherever development requires subsurface construction. The resulting excavations will be backfilled with clean soil.

Notwithstanding the foregoing, if lead is the only constituent exceeding the soil cleanup levels in Table 5 below, the following action may be utilized for the remaining lead contaminated soil:

Excavation and Off-site Disposal of lead contaminated soil will be performed in all portions of the property proposed for restricted residential development where soil concentrations of lead is 400 ppm or higher. Excavation will continue until the lead concentration measured at the exposed surface of the excavation is less than 400 mg/kg in the initial foot from the original surface, or less than 1,200 mg/kg at depths greater than one foot. The excavation will terminate at less than 12 inches if a residual soil lead concentration less than 400 mg/kg is measured within the initial foot of excavation. Soils in garden areas would be excavated until reaching a residual concentration of less than 400 mg/kg in the initial two feet from the original surface, or less than 1,200 mg/kg at depths greater than two feet. After confirmation sampling has verified that cleanup goals have been achieved, excavated areas will be backfilled with clean soil to original grade and re-vegetated.

If the final restricted residential development elevation will be below the original ground elevation at the time of the UPRR OU1 RFI and/or the UPRR OU2 RFI, soil excavation described in the preceding paragraph will all be based upon the proposed final restricted residential ground surface elevation. For example, if the proposed final restricted residential ground surface elevation will be two feet below the existing elevation and the soil lead concentrations at the proposed final restricted residential ground surface elevation is greater than 400 mg/kg, soil excavation shall continue as described in the preceding paragraph.

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Soil that may or will be disturbed by construction with soil lead concentrations higher than 1200 mg/kg shall be removed to a depth of one foot below the depth of excavation necessary for building foundations, utilities, etc., and construction workers in the area must be informed of the risks and safety precautions to be used. The excavated soil shall be properly disposed off-site. These excavations shall be backfilled with clean fill as construction is completed.

“Clean fill” is soil that has constituent concentrations below those suitable for unrestricted use except the clean soil lead level shall be 200 mg/kg or less.

TABLE 5
CONTINGENT RESTRICTED RESIDENTIAL USE SOIL CLEANUP LEVELS²

Contaminant	Health Effect	Contingent Restricted Residential Soil Cleanup Level (mg/kg)
Acetone	Toxicity	14,000
Benzene	Cancer	0.66
cis-1,2-Dichloroethene	Toxicity	43
trans-1,2-Dichloroethene	Toxicity	69
Ethyl Benzene	Toxicity	400
Methylene Chloride	Cancer	8.9
Tetrachloroethene	Cancer	0.55
Toluene	Toxicity	520
1,1,1-Trichloroethane	Toxicity	1,200
Trichloroethene	Cancer	0.043
1,2,4-Trimethylbenzene	Toxicity	52
Vinyl Chloride	Cancer	0.043
Xylenes	Toxicity	210
Anthracene	Toxicity	22,000
Benzo(a)anthracene	Cancer	0.15
Benzo(a)pyrene	Cancer	0.015
Benzo(b)fluoranthene	Cancer	0.15
Bis(2-ethylhexyl)phthalate	Cancer	35
Chrysene	Cancer	15
Dibenzo(a,h)anthracene	Cancer	0.015
Fluoranthene	Toxicity	2,300
Indeno(1,2,3-cd)pyrene	Cancer	0.15
Naphthalene	Toxicity	120

² These levels were selected from EPA Region 6 Human Health Medium Specific Screening Levels (2007)

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Contaminant	Health Effect	Contingent Restricted Residential Soil Cleanup Level (mg/kg)
Pyrene	Toxicity	2,300
Chlordane	Cancer	1.6
4,4-DDE	Cancer	1.7
4,4-DDT	Cancer	1.7
Dieldrin	Cancer	0.03
Endosulfan II	Toxicity	370
Endrin aldehyde	Toxicity	18
PCBs (total all PCBs)	Toxicity	0.22
Antimony	Toxicity	31
Arsenic	Toxicity	22
Cadmium	Toxicity	39
Chromium	Cancer	210
Copper	Toxicity	2,900
Lead	Toxicity	400
Mercury	Toxicity	23
Selenium	Toxicity	390
Silver	Toxicity	390
Zinc	Toxicity	23,000

MONITORED NATURAL ATTENUATION FOR RESTRICTED RESIDENTIAL USES

The EPA is selecting monitored natural attenuation (MNA) of contaminated groundwater at UPRR OU3 as a contingent corrective measure for restricted residential use. The MNA corrective measure encompasses a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. These in-situ processes include biodegradation; dispersion; dilution; sorption; volatilization; radioactive decay; and chemical or biological stabilization, transformation, or destruction of contaminants. The implementation of MNA shall be consistent with established guidance and/or protocols and shall scientifically determine whether MNA is occurring at rates sufficient to be protective of human health and the environment and provide a scientifically defensible estimate of the timeframe that will be required for MNA to attain cleanup levels in Tables 4 above and 6 below.

Note that any condition that may pose an immediate or potential threat to human health or the environment identified during monitoring or other activity shall be reported to EPA in accordance with paragraph 36 of the Administrative Order on Consent.

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LONG-TERM GROUNDWATER MONITORING FOR RESTRICTED RESIDENTIAL USES
AT UPRR OU3

The EPA is selecting long-term monitoring of groundwater at UPRR OU3 as a contingent corrective measure for restricted residential use. Long-term monitoring shall consist of a network of permanent, i.e., groundwater monitoring wells, and non-permanent, i.e., direct push, groundwater monitoring locations to monitor the progress and effectiveness of MNA and to determine if hazardous waste or hazardous constituents are migrating on to or off of the facility and at what concentration.

VAPOR INTRUSION MITIGATION FOR RESTRICTED RESIDENTIAL USES AT UPRR
OU3

The EPA is selecting vapor intrusion mitigation at UPRR OU3 as a contingent corrective measure for restricted residential use. The vapor intrusion mitigation corrective measure provides a menu of pre-approved actions that can be taken to minimize or eliminate exposure to chemical vapors from contaminated groundwater beneath UPRR OU3. These technologies may be used singly or in combination as the situation dictates for both new buildings and existing buildings where information shows the potential for adverse health effects from vapor intrusion. Where installed, vapor mitigation technologies must be monitored, operated and maintained to be effective.

Table 2 above includes those vapor mitigation technologies which are approved by EPA. UPRR may also propose in the CMI workplan other technologies or methods to protect human health from vapor intrusion.

LONG-TERM MONITORING OF VAPOR INTRUSION CONTAMINANTS AT UPRR OU3

The EPA is selecting long-term monitoring of vapor intrusion contaminants at UPRR OU3 as a contingent corrective measure for restricted residential use. The Long-Term Monitoring of Vapor Intrusion Contaminants includes, as appropriate, groundwater monitoring, soil vapor monitoring and/or monitoring of vapors in building interiors on a periodic basis to determine if contaminant concentrations are present, increasing or decreasing and the threat they pose to human health.

GROUNDWATER CLEANUP LEVELS FOR RESTRICTED RESIDENTIAL USES AT
UPRR OU3

The cleanup levels are calculated to meet the requirements of EPA's National Contingency Plan and to protect human health. For carcinogenic contaminants, the restricted residential use cleanup levels are proposed at a target excess cancer risk of 1×10^{-6} . EPA believes that this provides an adequate level of protection for restricted residential occupancy in UPRR OU3

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because of site specific factors. For non-carcinogenic contaminants, the non-residential use cleanup levels are based upon a HQ of 1.

EPA is establishing groundwater cleanup levels that are protective of restricted residential uses of UPRR OU3 including construction workers, on-site workers, recreational users and residents. Using the information from EPA's Johnson and Ettinger Model, the cleanup levels in Table 6 below are established to trigger contingent vapor intrusion mitigation in new or existing buildings and structures which will have human residency. Because of the restrictions being placed upon construction and groundwater use, EPA is not requiring cleanup to drinking water standards such as EPA's Maximum Contaminant Levels. Note that while the cleanup levels in Table 6 are believed to be protective of human health and environment if monitoring shows that the risk to human health for residential occupation from volatile organic chemicals from vapor intrusion exceeds a cancer risk of 1×10^{-6} or a hazard quotient of 1 interim measures or additional corrective measure will be necessary.

It should be noted that restricted residential development which may occur in areas that exceed the Johnson and Ettinger calculated groundwater target levels in Table 6 is prohibited unless those development projects include vapor mitigation measures to prevent potential human exposure to harmful levels of chemical vapors. The exact methods of construction and vapor mitigation will require EPA approval before the development can begin.

Using the information in the human health risk assessment, groundwater cleanup levels are also established to protect workers where construction of buildings and structures will require subsurface excavation. Table 4 above establishes the groundwater cleanup levels for subsurface construction.

TABLE 6
RESTRICTED RESIDENTIAL USE GROUNDWATER CLEANUP LEVELS³

Contaminant	Vapor Intrusion Residential GW Screening Level (µg/L)
Benzene	12
n-Butylbenzene	14,000
tert-Butylbenzene	4,569
Chlorobenzene	4,284
Chloroethane	24
Chloroform	5

³ These levels were developed using the Johnson and Ettinger Model to predict indoor air concentrations of volatile organic compounds

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Contaminant	Vapor Intrusion Residential GW Screening Level (µg/L)
4-Chlorotoluene	To Be Determined
1,2-Dichlorobenzene	27,460
cis-1,2-Dichloroethene	1,898
trans-1,2-Dichloroethene	1,856
Ethylbenzene	87
Isopropylbenzene	173
Methylene Chloride	343
Methyl tertbutyl ether	455,900
Naphthalene	893
n-Propylbenzene	5,558
Tetrachloroethene	14.4
Toluene	2,300
Trichloroethylene	0.57
1,2,4-Trimethylbenzene	456
1,3,5-Trimethylbenzene	391
Vinyl Chloride	1.6
Xylenes	178,000

INSTITUTIONAL CONTROLS FOR RESTRICTED RESIDENTIAL USE AT UPRR
OU1/UPRR OU3 AND/OR UPRR OU2/UPRR OU3

The EPA is selecting institutional controls to prohibit restrict residential use, groundwater use and preserve the implemented corrective measures at UPRR OU3 as a contingent corrective measure for restricted residential use. Institutional controls are non-engineering measures intended to affect human activities in such a way as to prevent or reduce exposure to hazardous substances. There are four categories of institutional controls: government controls; proprietary controls (controls based on private property law); enforcement agreements with governmental agencies; and informational devices (informational tools that provide information or notification that residual or capped contamination may remain on site). Institutional controls implemented by UPRR shall provide for, but not be limited to, the following restrictions:

- Any and all portions of UPRR OU1/UPRR OU3 or UPRR OU2/UPRR OU3 for which restricted residential uses shall occur shall not be used, developed or operated in any manner that will impair, degrade or compromise the contingent corrective measures for residential use set forth in this corrective measures decision.

FINAL CORRECTIVE MEASURES DECISION FOR
UNION PACIFIC RAILROAD OPERABLE UNITS NUMBER 2 AND 3 AND CONTINGENT RESTRICTED
RESIDENTIAL CORRECTIVE MEASURES FOR UPRR OU1, UPRR OU2 AND UPRR OU3

UNION PACIFIC RAILROAD, 9TH AND WEBSTER, OMAHA, NEBRASKA
RCRA ID# NED000829754

- Any and all portions of UPRR OU1/UPRR OU3 or UPRR OU2/UPRR OU3 for which restricted residential uses shall occur shall not be used for the installation and/or use of domestic, irrigation and other water wells of any type except for groundwater monitoring wells and temporary dewatering wells for construction purposes.

LONG-TERM MONITORING AND MAINTENANCE OF INSTITUTIONAL CONTROLS
FOR RESTRICTED RESIDENTIAL USES AT UPRR OU1/UPRR OU3 AND/OR UPRR
OU2/UPRR OU3

The EPA is selecting long-term monitoring and maintenance of institutional controls at UPRR OU1/UPRR OU3 or UPRR OU2/UPRR OU3 as a contingent corrective measure for restricted residential use. Long-term monitoring and maintenance is necessary for the continued effectiveness of the institutional controls. Long-term monitoring shall include periodic inspections of the facility to determine if property owners and/or tenants have complied with the restrictions imposed by the institutional controls and that the corrective measures are still protective of human health or the environment in light of any changed condition of the facility.

Note that any condition that may pose an immediate or potential threat to human health or the environment identified during monitoring or other activity shall be reported to EPA in accordance with paragraph 36 of the Administrative Order on Consent.

FINAL DECLARATIONS

Based upon the administrative record compiled for this corrective action, I have determined that the selected corrective measures to be implemented for non-residential uses of UPRR OU2 and UPRR 3 are appropriate and will be protective of human health and the environment.

In accordance with the administrative order on consent, U.S. EPA Docket No. RCRA-7-2000-0026, UPRR is to submit a draft Corrective Measures Implementation (CMI) workplan meeting the requirements of Appendix F, CMI Scope of Work, within 60 days of receipt of notification of EPA's selection of corrective measures for UPRR OU2 and UPRR OU3.

EPA has determined that restricted residential uses of UPRR OU1/UPRR OU3 and/or UPRR OU2/UPRR OU3 may occur. Based upon the administrative record compiled for this corrective action, I have determined that the contingent corrective measures as described herein for restricted residential uses of UPRR OU1/UPRR OU3 and/or UPRR OU2/UPRR OU3 are appropriate and will be protective of human health and the environment.

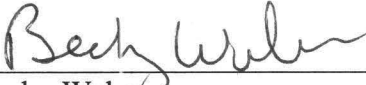
For the purposes of implementing the contingent corrective measures for restricted residential uses of UPRR OU1/UPRR OU3 and/or UPRR OU2/UPRR OU3, UPRR shall submit a CMI workplan and receive approval of same in advance of any remediation conducted that would allow for restricted residential uses of UPRR OU1/UPRR OU3 and/or UPRR OU2/UPRR OU3. No residential occupancy may occur until the contingent corrective measures for restricted

FINAL CORRECTIVE MEASURES DECISION FOR
UNION PACIFIC RAILROAD OPERABLE UNITS NUMBER 2 AND 3 AND CONTINGENT RESTRICTED
RESIDENTIAL CORRECTIVE MEASURES FOR UPRR OU1, UPRR OU2 AND UPRR OU3

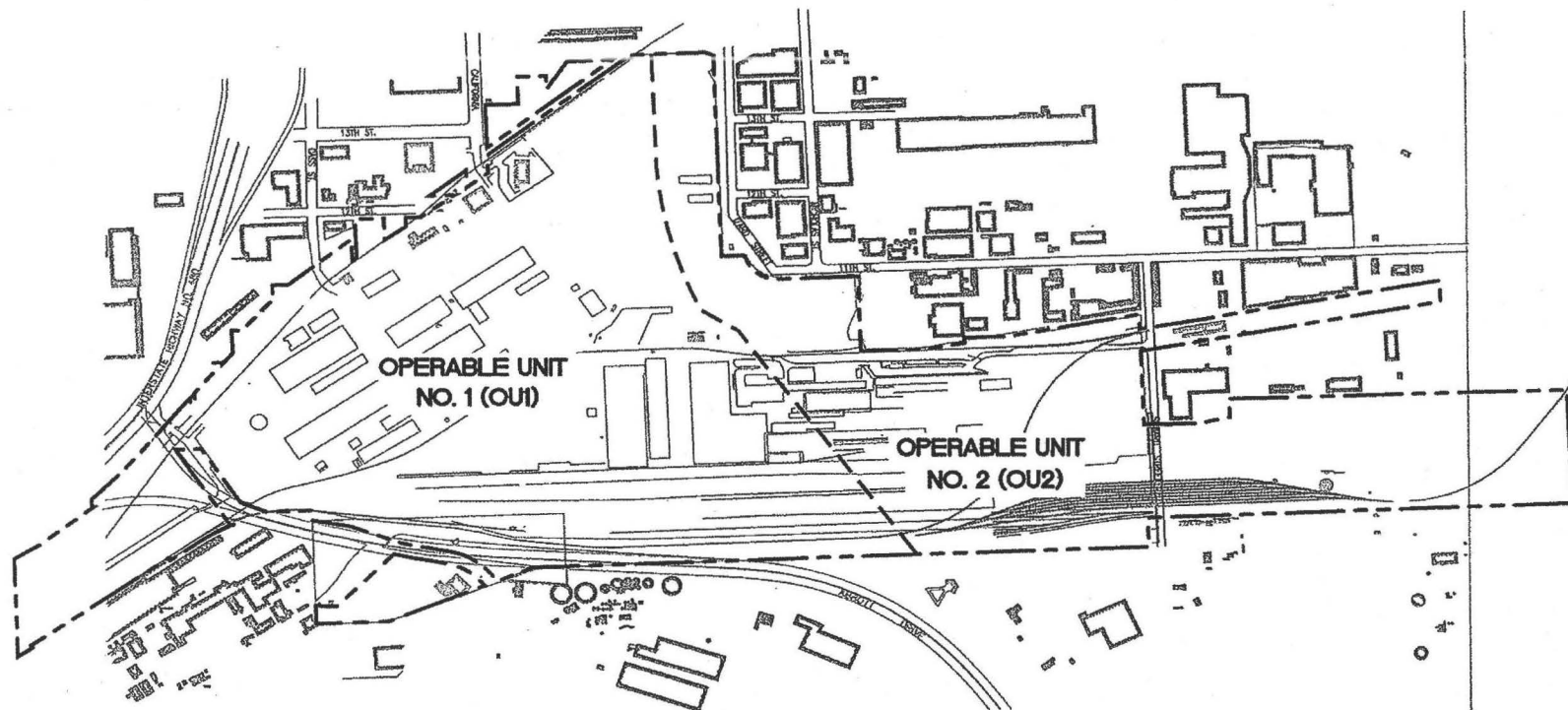
UNION PACIFIC RAILROAD, 9TH AND WEBSTER, OMAHA, NEBRASKA
RCRA ID# NED000829754

residential uses of UPRR OU1/UPRR OU3 and/or UPRR OU2/UPRR OU3 are fully implemented and both the soil and groundwater meet the respective restricted residential use cleanup levels.

Done this 27 day of Sept., 2007.


Becky Weber
Director
Air and Waste Management Division
EPA Region 7

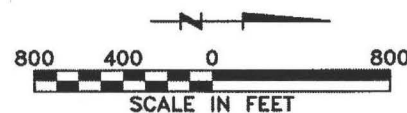
Attachment



NOTE:
OPERABLE UNIT NO. 3 (OU3) INCLUDES
GROUNDWATER UNDERLYING THE
ENTIRE OMAHA SHOPS PROPERTY.

LEGEND

----- PROPERTY LINE
----- OPERABLE UNIT

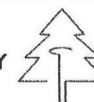


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Xrefs: uprrpropline.DWG DRILLHOLES.DWG

OPERABLE UNITS



OMAHA SHOPS
UNION PACIFIC RAILROAD COMPANY



URS Greiner Woodward Clyde

DRN BY DAP	DATE 11/30/99	PROJECT NO.	FIG. NO.
CHK'D BY	REVISION 0	45-091MC204.02	1-2

